Questions from Yesterday

- Circle
- Triangle
- Square
1. What did the popcorn do? How did it act in the test tube?
2. What materials do we need if we are going to come up with a question around popping popcorn?

3. What could we change about these materials that might make a difference on how the popcorn pops
4. What could we observe or measure that would tell us changing brand of popcorn makes a difference in how it pops?

Generating the Question

0 Investigate the affect of ____________

0 on ____________________________.
4 Question Strategy

- Brainstorming tool used to generate ideas to develop question.
- Can start anywhere in the process—can begin with question 3 or begin with question 1.

Part of teaching and any science program should be to help helping students learn how to tolerate ambiguity, consider possibilities, and ask questions.
Generating Questions

- Using your senses, make observations about the object at your table.
- Now, using the index cards on your table, generate as many questions as you can about your object.
  - Put one question on each index card.
Range of Questions

- Share some questions your group came up with about your object.

Card Sort-5 Minutes

- Working with your team, sort your cards into two piles.
  - **Investigable questions** are the ones you think can be investigated by doing something concrete with tools and materials.
  - **Noninvestigable questions**—sometimes called “noninvestigatable”—are the ones you think cannot be answered by investigating with tools and materials.
Examine the stacks of investigable and non-investigable questions you generated.

Think about what makes a question investigable, and come up with some criteria for identifying investigable questions.

Have one person record your criteria.

Take about 10 minutes.
Types of Research Questions

Descriptive
- Questions beginning with “why” are requesting information rather than suggesting an action that can be taken. Generally, these questions can be answered by using a reference book or the Internet or by asking an experienced person.
- To make more research-based have students collect data through surveys about their topic.

Historical Questions

- Historical
  - Questions beginning with who are seeking knowledge about something in the past. Generally, these questions can be answered by using a reference book or the Internet or by asking an experienced person.
  - Have students do a survey about the topic.
Experimental Questions

0 These are the questions scientists answer.
0 These questions have variables that are able to be manipulated.

Get the Gist

Summarization
Question: Are all People the Same?

Make some observations about those of your friends sitting at your table.
My Traits Please!

- Can you roll your tongue?

- Are your earlobes
  - Free (A)
  - Attached (B)
My Traits Please!

0 Can you taste PTC paper?
0 If the chemical tastes bitter-then you can taste it.

My Traits Please!

0 Creating a Trait Tree
0 What type of earlobes did you have?
0 Could you taste the PTC paper?
0 Could you roll your tongue?
Data Analysis

- What does our data tell us?

My Traits Please!

- What is the most common combination of traits in the class?
- What is the least common combination of traits in the class?
Define our concept

- Using the concept definition frame:
  - List characteristics of a population. What is a population like?
  - What are some examples?
  - Using examples and the characteristics, define the word population.

What is it?
What is it like?

Population
Examples
What Type of Research

0 How would you classify the previous lesson?
   0 Descriptive research
   0 Historical
   0 Experimental

0 Why?

Break

0 After break – grade level sessions
Exit Ticket

Penny For Your Thoughts!

Using the penny you have at your desk, use the last number in the date of the penny to write statements indicating what you have learned today.

For example, if you have a 1972 penny, you would write two statements sharing what you learned today.